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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,515	03/25/2004	Yukio Hanamoto	2185-0722PUS1	5551

2292 7590 02/22/2006

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EXAMINER
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LEE, SIN J

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

4

<b>Office Action Summary</b>	<b>Application No.</b> 10/808,515	<b>Applicant(s)</b> HANAMOTO ET AL.	
	<b>Examiner</b> Sin J. Lee	<b>Art Unit</b> 1752	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 November 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 and 15-18 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

#### ***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-7, 9, 13, 15, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al (US 2001/0016298 A1) in view of Trefonas, III et al (5,350,714) and Nishi et al (5,759,736).

In Example 1 (see [0115], [0122], and [0104]-[0105]), Nakanishi teaches a chemically amplified positive resist composition comprising Resin A-1, a photoacid generator, 2-,6-diisopropylaniline (a quencher), and a solvent. The Resin A-1 is a copolymer of 2-methyl-2-adamantyl methacrylate/3-hydroxy-1-adamantyl

methacrylate/ $\beta$ -methacryloyloxy- $\gamma$ -butyrolactone. Nakanishi does not teach that his resin is treated with activated carbon.

Trefonas states (col.1, lines 29-33) that the removal of contaminants from processing fluids used for the production of integrated circuits before or during use is basic insurance for prevention of damage to the integrated circuit, and the reference teaches (see col.3, lines 56-68, col.4, lines 1-16, and Example 1) a process of removing contaminants from photoresist composition solutions by using a module containing activated carbon. Also, as evidenced by Nishi et al (col.7, lines 33-42), it is known in the art that when purifying a photoresist composition, either the respective constituting components are respectively purified by e.g., an ion exchange method and then mixed to produce the photoresist composition, or the respective constituting components are mixed to form a photoresist composition, which is then purified by e.g., an ion exchange method before use. Based on the teaching of Trefonas and Nishi, it would have been obvious to one of ordinary skill in the art to purify the respective constituting components of Nakanishi's resist composition by using a module containing activated carbon and then mix those purified components to produce the resist composition in order to prevent any damage to the integrated circuit, which is to be formed by using Nakanishi's resist composition. Therefore, Nakanishi in view of Trefonas and Nishi would render obvious present inventions of claims 1-5, 7, 9, 13, 15, 16 and 18 (it is the Examiner's position that the chemical amplification resist composition of Nakanishi which is produced by the method taught by Trefonas in view of Nishi would inherently possess present clogging degree range of claims 1 and 18).

With respect to present claim 6, Nakanishi teaches the equivalence of the 2-methyl-2-adamantyl group (as in the monomer unit of 2-methyl-2-adamantyl methacrylate of his Resin A-1) and tetrahydro-2-pyranyl group as acid labile groups (see [0020]). Therefore, it would have been obvious to one of ordinary skill in the art to use the monomer unit of tetrahydro-2-pyranyl methacrylate instead of the monomer unit of 2-methyl-2-adamantyl methacrylate in Nakanishi's Resin A-1. Therefore, Nakanishi in view of Trefonas and Nishi would render obvious present invention of claim 6.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al (US 2001/0016298 A1) in view of Trefonas, III et al (5,350,714) and Nishi et al (5,759,736) as applied to claim 1 above, and further in view of Uetani et al (US 6,548,220 B2).

Nakanishi in view of Trefonas and Nishi do not teach present repeating unit of claim 8. Uetani teaches that a resin containing the polymerization unit of 2-norbornene exhibits an excellent dry etching resistance characteristic (see col.28, lines 4-7). Since Nakanishi teaches (see ([0028]-[0029])) that his resin can contain optional monomer units, it would have been obvious to one of ordinary skill in the art to add the monomer unit of 2-norbornene into Nakanishi's Resin A-1 in order to obtain excellent dry etching resistance characteristic as taught by Uetani. Therefore, Nakanishi in view of Trefonas, and Nishi, and further in view of Uetani would render obvious present invention of claim 8.

5. Claims 1-4, 10-13, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Urano et al (US 6,656,660 B1) in view of Trefonas, III et al (5,350,714) and Nishi et al (5,759,736).

In Example 4 (see Table 2), Urano teaches a positive resist composition comprising poly(p-1-ethoxyethoxystyrene/*p*-hydroxystyrene/*p*-*tert*-butoxycarbonyloxystyrene), poly(p-1-ethoxy-n-propoxystyrene/*p*-hydroxystyrene/*p*-*tert*-butoxystyrene) a photoacid generator, and a solvent. Urano does not teach that his resin is treated with activated carbon.

Trefonas states (col.1, lines 29-33) that the removal of contaminants from processing fluids used for the production of integrated circuits before or during use is basic insurance for prevention of damage to the integrated circuit, and the reference teaches (see col.3, lines 56-68, col.4, lines 1-16, and Example 1) a process of removing contaminants from photoresist composition solutions by using a module containing activated carbon. Also, as evidenced by Nishi et al (col.7, lines 33-42), it is known in the art that when purifying a photoresist composition, either the respective constituting components are respectively purified by e.g., an ion exchange method and then mixed to produce the photoresist composition, or the respective constituting components are mixed to form a photoresist composition, which is then purified by e.g., an ion exchange method before use. Based on the teaching of Trefonas and Nishi, it would have been obvious to one of ordinary skill in the art to purify the respective constituting components of Urano's resist composition by using a module containing activated carbon and then mix those purified components to produce the resist

composition in order to prevent any damage to the integrated circuit, which is to be formed by using Urano's resist composition. Therefore, Urano in view of Trefonas and Nishi would render obvious present inventions of claims 1-3, 10-12, 15, 17 and 18 (it is the Examiner's position that the resist composition of Urano which is produced by the method taught by Trefonas in view of Nishi would inherently possess present clogging degree range of claims 1 and 18).

With respect to present claim 4, Urano's poly(p-1-ethoxy-n-propoxystyrene/p-hydroxystyrene/p-tert-butoxystyrene) has 10 mol% of p-tert-butoxystyrene unit (see Production Example 6). Thus, Urano in view of Trefonas and Nishi would render obvious present invention of claim 4.

Urano also teaches the use of a basic compound (such as triethylamine) in his composition. Thus, Urano in view of Trefonas and Nishi would render obvious present invention of claim 13.

### ***Response to Arguments***

6. Applicants argue that Trefonas fails to disclose the treatment of a chemical amplification photoresist composition and it also fails to disclose treatment of a resin before the resin is combined with an acid generator and solvent to form a composition. Applicants also argue that Trefonas fails to address any issues associated with improving the clogging degree of a photoresist composition, which issues are addressed and achieved in present invention.

Applicants' arguments are found to be unpersuasive. Trefonas states that his invention is *especially useful for the removal of contaminants from solutions used in*

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***integrate circuit manufacture***, and both of Nakanishi et al'298 and Urano et al'660 teach a chemical amplification photoresist composition useful for manufacturing semiconductor devices. Therefore, one skilled in the art would have been motivated to use Trefonas's technique in purifying the resins of Nakanishi and Urano in order to ensure removal of contaminants from the photoresist solutions used (for manufacturing semiconductor devices) in Nakanishi and Urano. Also, since it is known in the art, as evidenced by Nishi, that one can *either* purify each of the components of a photoresist composition before mixing them together *or* mix each of the components of a photoresist composition first and then purify the resulting composition, it would have been obvious to one skilled in the art to purify each of the components of Nakanishi's or Urano's resist composition by using a module containing activated carbon (as taught by Trefonas) and then mix those purified components to produce the resist composition in order to prevent any damage to the integrated circuit, which is to be formed by using Nakanishi's or Urano's resist composition. Also, since present specification clearly states on pg.1 (last paragraph) that reduction of the amount of the foreign objects in a photoresist composition is highly required, and since Trefonas's invention is also drawn to removal of contaminants from photoresist composition used in integrated circuit manufacture, applicants' argument that Trefonas fails to address any issues associated with improving the clogging degree of a photoresist composition is found to be unpersuasive.

The Examiner is not considering Yamamoto's Declaration filed on November 30, 2005 because the declaration is not signed.

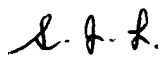


For the reasons stated above, present rejections still stand.

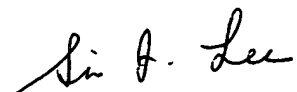
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee  
February 20, 2006

  
**SIN LEE**  
**PRIMARY EXAMINER**